

## NON-PHARMACOLOGICAL STRATEGIES ON PAIN RELIEF DURING LABOR: PRE-TESTING OF AN INSTRUMENT<sup>1</sup>

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Davim RMB, Torres GV, Melo ES. Non-pharmacological strategies on pain relief during labor: pre-testing of an instrument. Rev Latino-am Enfermagem 2007 novembro-dezembro; 15(6):1150-6.

*This descriptive study aimed to evaluate the effectiveness of Non-Pharmacological Strategies (NFS) on pain relief of parturients as part of a research instrument to be utilized in a Doctoral Dissertation. In order to evaluate the NFS, the Analogous Visual Scale (AVS) was used on 30 parturients attended at the Humanized Labor Unit of a school-maternity hospital in Natal, RN, Brazil. Of the six NFS (respiratory exercises, muscular relaxation, lumbosacral massage, shower washing, deambulation and pelvic swing), two were excluded post-test (deambulation and pelvic swing) for not being accepted by the parturients. The remaining NFS (respiratory exercises, muscular relaxation, lumbosacral massage, and shower washing) which reached satisfactory acceptance and applicability rates, were found to be effective in relieving pain of these parturients, and thus deemed adequate for use in the Doctoral Dissertation data collection process.*

DESCRIPTORS: pain; strategies

## ESTRATEGIAS NO FARMACOLÓGICAS EN EL ALIVIO DEL DOLOR DURANTE EL TRABAJO DE PARTO: PRE-TEST DE UN INSTRUMENTO

*Estudio descriptivo, objetivando evaluar la efectividad de Estrategias No Farmacológicas (ENF) en el alivio del dolor de parturientas para hacer parte de un instrumento de investigación a ser utilizado en la preparación de Tesis de Doctorado. Para evaluar las ENF, utilizamos la Escala Analógica Visual (EAV), con 30 parturientas, teniendo como local de la investigación la Unidad de Parto Humanizado de una Maternidad Escuela en Natal/RN. Verificamos que, de las seis ENF (ejercicios respiratorios, relajamiento muscular, masaje lombo-sacra, baño de lluvia, deambulación y balance pélvico), dos fueron excluidas después del Pre-Test (deambulación y balance pélvico), por presentar dificultades en su aplicación. Los demás (ejercicios respiratorios, relajamiento muscular, masaje lombo-sacra y baño de lluvia) tuvieron índices satisfactorios de aceptación y aplicación, demostrando ser efectivas en el alivio del dolor de esas parturientas, siendo por lo tanto adecuadas su utilización como instrumento de recolecta de datos en la Tesis de Doctorado.*

DESCRIPTORES: dolor; estrategias

## ESTRATÉGIAS NÃO FARMACOLÓGICAS NO ALÍVIO DA DOR DURANTE O TRABALHO DE PARTO: PRÉ-TESTE DE UM INSTRUMENTO

*Estudo descritivo objetivando avaliar a efetividade de Estratégias Não Farmacológicas (ENF) no alívio da dor de parturientes para fazerem parte de um instrumento de pesquisa a ser utilizado em tese de doutoramento. Para avaliar as ENF, utilizou-se a Escala Analógica Visual (EAV) com 30 parturientes, tendo como local de pesquisa a unidade de parto humanizado de uma maternidade escola em Natal, RN. Verificou-se que, das seis ENF (exercícios respiratórios, relaxamento muscular, massagem lombossacral, banho de chuveiro, deambulação e balanço pélvico), duas foram excluídas após o pré-teste (deambulação e balanço pélvico), por apresentarem dificuldades de aceitação pelas parturientes. As demais (exercícios respiratórios, relaxamento muscular, massagem lombossacral e banho de chuveiro), com índices satisfatórios de aceitação e efetividade, demonstraram ser efetivas na redução da dor dessas parturientes, sendo, portanto, adequadas para a utilização no instrumento de coleta de dados na tese de doutoramento.*

DESCRIPTORES: dor; estratégias

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## INTRODUCTION

The Taxonomy Committee of the International Association for the Study of Pain (IASP) has, since 1986, attributed a concept to the word pain as a sensorial, emotionally unpleasant experience, associating it to actual or potential tissue lesions. It is involved by unpleasant, subjective sensations and each individual uses the word in accordance with his/her previous experiences, in a certain way representing an emotional experiment.<sup>(1)</sup> The word pain can further be described as a complex, individual and multifactor phenomenon, influenced by several factors, namely: psychological, biological, sociocultural and economic. In a way, pain can be shared from the reports by those who feel it, characterized by normal transformations, such as menstrual pain and labor pain for example.<sup>(2)</sup>

For most women, labor pain is considered the worst experience of their lives. The pain of uterine contractions is a complex process involving interactions between central and peripheral mechanisms, as well as the continuous interchange of information by ascending and descending nociceptive channels. In this context, we understand that labor pains involve emotional, sensorial, environmental and existential factors.<sup>(3)</sup>

Therefore, we must understand how the physiology of pain is processed, which is not the same throughout labor, varying in accordance with its evolution. During the first stage, i.e. dilation, pain is visceral, arising due to uterine contractions and dilation of the cervix, transmitted by the sympathetic efferent fibers. In this stage, pain is conveyed to the spinal cord at the level of T10-L1 by Delta A fibers and C efferent visceral fibers originating in the lateral wall and uterine bottom. The transmission that follows efferent from the womb (uterus) and cervix toward the spinal cord is conveyed by means of the hypogastric and aortic plexus. So, the nociceptive efferent impulses cross the lumbar sympathetic chain and pass to the thoracic sympathetic chain by means of branches that communicate with the T10-L1 nerves. Therefore, the fibers that lead the painful impulse perform synapses with the interneuron of the dorsal spine returning after modulation<sup>(3)</sup>.

In the second stage, i.e. expulsion, the nociceptive stimulation of the contractions derived from the uterine body and distension of the segment continues when the cervix reaches its full dilation.

Moreover, the presence of the fetus exerts pressure on the structures of the pelvis, which will give rise to the somatic pain, when the stretching of the fascia and subcutaneous tissues of the birth canal occur, distension of the perineum and pressure on the pelvic floor muscles. It is understood that, in the second stage of labor, somatic pain is transmitted to the pudendal nerve at the height of the sacral vertebrae S2, S3 and S4. On the other hand, while the pain from the first stage behaves in a diffuse and ill-located way, the somatic pain of the second stage is more intense and well located<sup>(3)</sup>.

There is not, however, a clear delimitation between labor and delivery, but a gradual transition, making it difficult to establish the beginning of the dilation of the cervix. Therefore, in the first stage, i.e. dilation, in principle, between 2 and 3 uterine contractions can occur in 10 minutes, possibly increasing to 5 every 10 minutes at the end of this stage. For a better visualization, in the dilation stage, the analysis of Friedman's labor chart presents a latent and an active phase<sup>(4)</sup> in the women. The active stage is subdivided in three moments: acceleration, maximum inclination and deceleration, according to the sigmoid curve of the cervix dilation (cm) of the latent and active stages in the preparatory divisions of pelvic dilation in labor (illustration as a courtesy from Dr. Casey, re-drawn by Friedman, 1978), as seen in Figure 1.

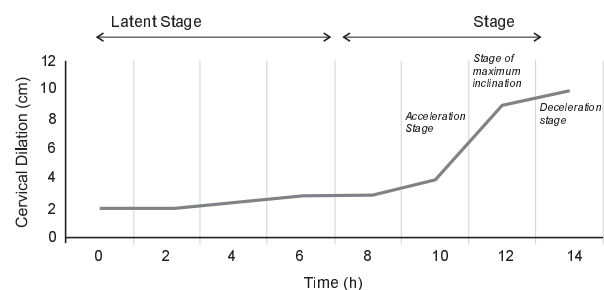


Figure 1 - Sigmoid curve of cervix dilation (cm) of the latent and active stages and the preparatory divisions of pelvic dilation in labor

The latent stage goes from the beginning of labor up to a point where the curve starts a defined upward tendency. In this stage, there are irregular, short, weak uterine contractions, and the cervix dilates from 3 to 4 cm, although it may take several hours and the parturient, when she goes to the maternity hospital or health care unit, describes them as abdominal cramp, discomfort and low discomfort, expressing excitement

and apprehension. The distribution of the pain is located particularly in the central part of her back and the sensation, quite often, is referred to as a slight intensive cramp, becoming more severe<sup>(4)</sup>.

The active stage starts when the dilation curve begins an abrupt upward tendency and ends when full cervical dilation is reached, that is, 10 cm. Dilation evolves more rapidly, after an initial period of acceleration, when the cervix dilates from 3 to 5 cm, a stage of maximum inclination between 5 and 8 cm, with contractions of moderate intensity and a stage of deceleration with the cervix dilated between 8 and 10 cm, when intense and spasmodic contractions occur. The distribution of pain at this stage is located in the anterior abdomen, the duration becomes constant and associated to full cervical dilation; the pain sensation is most often referred to as intense, constrictive, frequently excruciating. In summary, the acceleration stage is short and variable; the maximum inclination reflects the effectiveness of the uterine contraction, while deceleration translates into the fetopelvic relation. Therefore, the active stage extends up to the full dilation of the cervix and the beginning of the expulsive period<sup>(4)</sup>.

In view of these considerations, pain in the active stage of the dilation period during labor is the central focus of this pre-test, since, as the contractions become more frequent and intense in this stage, they cause tension, fear and, consequently, worsening of the pain. Thus, an important task to help women in regular child birth to bear the pain is through humanized support and approach, identifying its quantitative and qualitative aspects, for the systematic planning of information and soothing orientation provided by health care professionals or other people who assist these women.

Even if each parturient responds to pain in a personal and adaptive way, non-pharmacological interventions can help reduce the painful perceptions, changing this response in most of the parturients. To permit adequate interventions in this sensation, one must understand the type of pain that is usually felt during labor, the physical and psychological factors that influence this perception and how the observation of the behavioral pattern can clarify a parturient's response to pain<sup>(4)</sup>.

In accordance with this information, a revision study was performed to find out about women's satisfaction with delivery, especially in terms of pain relief. The systematic review of this study identified four expectations in the parturient's satisfaction: personal factors, the support of the professionals, the quality of

the professional-patient relation and the involvement in the intervention decision. These expectations seem to be more important in labor care in relation to age, socioeconomic factor, race, preparation for child birth, physical environment for child birth, pain, immobility, medical interventions and care continuity. The authors have come to the conclusion, in this revision, that the evaluation of the parturients' satisfaction with their child birth experience are not related with the influences of pain, pain relief and medical interventions, but rather with the influence exerted by health professionals' attitudes and behavior<sup>(5)</sup>.

Therefore, professional posture is relevant in parturient care, considering that this can all be performed, in addition to the empathetic approach, associated with the use of adequate Non-Pharmacological Strategies (NFS), aimed at soothing the ever-present pain in parturients, considering the interpersonal relations in professional-parturient-family interaction. Through the application of these strategies, the labor process may be less painful, less tense, since they need attention, counseling and communication skills, aimed at better conducting child birth.

In this context, this research was motivated by the need to select NFS for parturient pain relief in the labor process, aiming at the construction of a data collection instrument for a Doctoral Dissertation on Health Sciences/UFRN, with the general aim of evaluating the effectiveness of NFS to relieve the pain intensity level and reduce the parturients' level of state-anxiety during their active stage of labor. So, this research tried to select NFS and assess their effectiveness for parturient pain relief during labor. Finally, we proposed the following objectives for the research: to identify NFS for parturient pain relief in the labor process in Bireme Data Base Systems, Capes Periodicals and SIBI-USP; evaluate the effectiveness of the NFS in parturient pain relief during the active stage of labor and select the NFS that present acceptance percentages of e" 80% by the parturients and effective pain relief in the study participants for inclusion in the data collection instrument used for the Doctoral Dissertation.

## METHOD

This is a quasi-experimental non-controlled and non-randomized therapeutic intervention research with a quantitative approach, also called "before and after" study, in which all individuals receive the same treatment

and their condition is checked at baseline and at several moments after treatment<sup>(6)</sup>. The research scenario was the Humanized Labor Unit (HLU) of the Januário Cicco Teaching Maternity Hospital (MEJC) at the Federal University of Rio Grande do Norte (UFRN), located in Natal/RN, in the Northeast of Brazil. The HLU, which served as the place of study for the pre-test and the Doctoral' Dissertation, consists of four suites destined for individualized care delivery to women in labor and is installed on the second floor of the institution.

Before the research, the study was submitted to the Research Ethics Committee at the Federal University of Rio Grande do Norte (UFRN) for evaluation and received a favorable opinion, being registered at the CEP-UFRN as 045-2005 on June 10, 2005, in accordance with Resolution 196/96 by the National Health Council (CNS). The research was developed in two stages: the first involved the identification and selection of the NFS in the Bireme Data, Capes Periodicals and SIBI USP Systems, and the second the application and verification of the NFS' effectiveness in the participating parturients.

1st Stage: Identification and selection of the NFS

In order to select the NFS, we consulted the Systems of Bireme Data Bases, Capes Periodicals and SIBI USP. This survey resulted in eleven scientific studies in national and international scopes<sup>(5,7-17)</sup> related to the evaluation of the parturients' pain during the active stage of labor with the use of NFS. Based on the results of these studies, we selected the strategies that presented the highest evidence of relief in the parturients' pain during the active phase of labor, namely: respiratory exercises, muscle relaxation, lumbosacral massage, walking, pelvic balancing and shower bathing, as shown in Table 1.

Table 1 - NFS with best evidence at satisfactory levels for pain relief during labor

Author (s)	NFS	Type of Study
Ochiai AM, Gualda DMS	Shower bathing	Quantitative clinical trial
Medina ET	Warm bathing	Exploratory qualitative clinical trial
Lopes TC	Bobath Ball (Birth Ball)	Experience report
Almeida NAM, Souza JT, Bachion MM, Silveira NA	Breathing and relaxation techniques	Experimental field research
Silva FMB, Oliveira SMJV	Bath (immersion)	Randomized study, experimental clinical trial
Paula AAD, Carvalho EC, Santos CB	Progressive muscular relaxation	Non-randomized, controlled quasi experimental intervention study
Almeida NAM, Bachion MM, Silveira NM, Souza JT.	Breathing and relaxation	Descriptive study with participative observation
Silveira IP, Campos ASC, Fernandes AFC.	Massage	Field research
Castro JC, Clapis MJ.	Humanized actions	Qualitative research

In this respect, we decided to apply these strategies (respiratory exercises, muscle relaxation, lumbosacral massage, walking, pelvic balancing and shower bathing) in this study, with a view to assessing the parturients' acceptance of these strategies and the effectiveness in relieving their pain during the active stage of labor.

The instrument for data collection consisted of two parts. The first involved the parturients' characteristics and looked at the following variables of interest: age, education, religion, origin, family income, parity, pre-natal treatment, diagnosis, companion and prescribed medication. The second included the NFS selected in the first stage of the study (respiratory exercises, muscle relaxation, lumbosacral massage, walking, pelvic balancing and shower bathing), aiming at relieving the parturients' pain during the active stage of labor.

2nd Stage: Application and verification of the NFS' effectiveness in the parturients.

Thirty parturients selected by accessibility sampling participated in the study, as they were admitted meeting the following inclusion criteria: being in regular active labor of a second pregnancy, age > 20 years, presenting dilated cervix of up to 6 centimeters, without clinical indication of dystocia; accepting to participate in the study and signing the informed consent term. Exclusion criteria were: first pregnancy; age < 20 years; background of previous caesarian sections or suggestion of medical indication, clinical diagnosis of dystocia and requesting withdrawal from the study.

Data collection took place in a real situation during the active stage of labor on three pre-defined occasions: during the acceleration stage, when the parturient was included in the study with up to 6 cm of cervix dilation and application of EAV soon after the first uterine contraction without the use of the NFS. Afterwards, in the subsequent uterine contraction, the joint strategies were applied (respiratory exercises, muscle relaxation and lumbosacral massage) with the evaluation of the EAV. During the maximum inclination stage, between 7 and 8 cm of dilation, the parturient's pain intensity was also measured by means of the EAV, after uterine contraction without the use of the NFS, and subsequently in the following contraction with the use of the jointly used (respiratory exercises, muscle relaxation and lumbosacral massage) and isolated strategies (walking and shower bathing). During the deceleration stage, between 9 and 10 cm of dilation,

EAV was applied after the contraction without the use of the NFS, and at a second moment with the strategies together (respiratory exercises, muscle relaxation and lumbosacral massage) and separately (walking and shower bathing).

The NFS selection criterion for inclusion in the Doctoral Dissertation instrument referred to instruments with acceptance percentages  $\geq 80\%$  by the study participants, with effective pain relief during the active stage of labor. The collected data were initially transported to a spreadsheet in a database in Excel for Windows 2000 program and, subsequently, submitted to analysis, using Mann-Whitney's U Test, with a statistical significance level of  $p < 0.05$ , comparing the pain scores of the EAV verified *before* and *after* the NFS during the three moments of the active stage of labor.

## RESULTS AND DISCUSSION

Of the 30 parturients under study, 70.0% were between 21 and 29 years old, 83.3% had incomplete elementary education, 80.0% were catholic, 66.7% received up to 2 minimum wages as family income, 56.7% were from Natal and 43.3% were from the interior of the state. As to parity, 66.7% had from 2 to 3 children, 100.0% received pre-natal treatment with a minimum of 6 visits, as recommended by the Ministry of Health. With reference to the gestational age, in accordance with the medical diagnosis, 83.3% were between 38 and 40 weeks pregnant, and 70.0% had a companion, i.e. their partner in 53.3% and their mother in 13.3%. The most used medication was oxytocin (90.0%) and only 3.3% did not receive any medication. As to the application of the NFS (respiratory exercises, muscle relaxation, lumbosacral massage, walking, pelvic balancing and shower bathing), the acceptance percentages among the women in this study are shown in Table 2.

Table 2 - Acceptance of the NFS by the study participants during the active stage of labor according to the selection criterion

Non-pharmacological strategies (NFS)	Parturient acceptance		Selection criteria selected (>80%) not selected (<80%)
	Nº	%	
Respiratory exercises	30	100.0	Selected
Muscle relaxation	30	100.0	Selected
Lumbosacral massage	30	100.0	Selected
Walking	2	6.6	Not Selected
Pelvic balancing	1	3.3	Not Selected
Shower bathing	26	86.6	Selected

The walking (6.6%) and pelvic balancing (3.3%) strategies were not selected to verify effectiveness because they did not meet the pre-established acceptance criterion of  $\geq 80.0\%$ . Respiratory exercises, muscle relaxation, lumbosacral massage and shower bathing obtained acceptance percentages above 80.0%, being therefore selected for the application of Mann-Whitney's U Test, with a statistical significance of  $p = < 0.05$  for the verification of the effectiveness in parturient pain relief during the active stage of labor.

It was identified that, when three associated NFS, respiratory exercises, muscle relaxation and lumbosacral massage were applied together, there was a significant different in the relief of pain intensity among parturients with 6, 8 and 9 cm of dilation of the cervix, as shown in Figure 2.

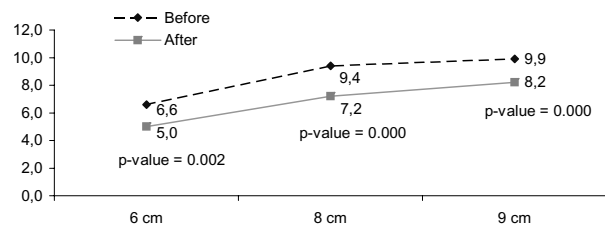


Figure 2 - Pain intensity "before and after" the application of the combined NFS with 6, 8 and 9 cm of dilation of the cervix during the active stage of labor. Natal-RN-2006

The joint application of respiratory exercises, muscle relaxation and lumbosacral massage presented pain relief when they were used. When looking at the different pain scores "before and after" in the application of these NFS, the joint use was effective at the three moments of cervix dilation because they presented  $p < 0.05$ .

The analysis of the three moments "before and after" in the application of the associated NFS (respiratory exercises, muscle relaxation and lumbosacral massage) revealed the relief of the parturients' pain, with a reduction in its intensity at 8 cm after the application of the joint strategies, as compared with the 6 cm before in the use of the same strategies, as well as at 9 cm after the application of the NFS, when compared to 8 cm before these strategies, since an increase in pain intensity would be expected as the dilation of the cervix evolved between 6 and 9 cm in this stage of labor.

In an experimental field research, the respiratory exercise and muscle relaxation techniques

showed that they did not reduce the pain intensity of the parturients under analysis; however, they maintained low anxiety levels in the child birth process for a longer time<sup>(12)</sup>.

On the other hand, in a quasi-experimental intervention study, when progressive muscle relaxation techniques were applied to women during labor, this technique was observed as causing the perception of relief in the parturients' pain. This is relevant as the effects of the researchers' interference in data collection during the application of the technique showed an important reduction in the pain level of the parturients under study<sup>(14)</sup>.

A qualitative research that looked at how obstetric nurses perceived the humanization of labor care at a maternity in the interior of São Paulo State showed that these nurses could support and guide the parturients with courses, that they offer comfort measures, such as a peaceful environment, shower bathings and permission for a companion, and they avoid unnecessary interventions<sup>(17)</sup>.

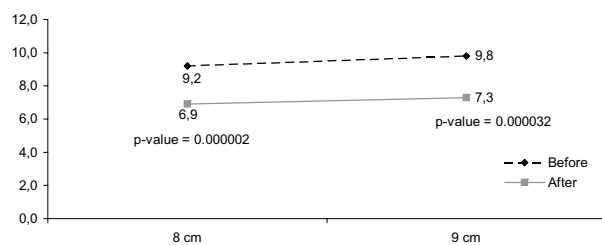


Figure 3 - Intensity of the pain "before and after" the application of shower bathing at 8 and 9 cm of cervix dilation during the active stage of labor. Natal/RN - 2006

In Figure 3, the results obtained for shower bathing at 8 and 9 cm of cervix dilation show significant pain relief at the two application times, confirming its effectiveness in the reduction of the parturients' pain in this stage.

In a clinical assay, it was shown that shower bathing reduced the time of labor and that the water acted on the portal of the pain, reducing the sensation of pain by causing gradual relaxation in the parturients<sup>(8)</sup>. Another clinical assay showed that shower bathing during the active stage of the dilation period promoted feelings of well-being and comfort, such as relief, relaxation and reinvigoration. The authors suggest that the strategy be encouraged at obstetrical centers as a result of its availability, accessibility and low cost of intervention<sup>(7)</sup>.

It was identified from an experience report that shower bathing associated with other non-pharmacological techniques, such as the Bobath Ball and lumbar massages, provides comfort during contractions. In this respect, the water should fall over the most painful places and that the Bobath Ball, outside shower bathing, must also be associated to lumbar massages to favor pain relief during the contractions<sup>(9)</sup>.

In an experimental randomized clinical assay, performed at a philanthropic public maternity in São Paulo City, it was noticed that the immersion bath in pain relief during labor presented advantages in reducing and postponing the use of drugs in pain control, thus being a feasible option for the comfort of the parturient, without interfering in the progression of labor<sup>(13)</sup>.

## CONCLUSIONS

Among the NFS for pain relief in the labor process identified in the database under analysis, when they were applied to the parturients in this study, the respiratory exercises, muscle relaxation, lumbosacral massage and shower bathing presented an acceptance percentage above 80.0%, while walking and pelvic balancing were rejected, obtaining percentages below those accepted by pre-established criteria.

As to the effectiveness of the strategies the parturients accepted for pain relief during the active stage of labor, we noticed that the pain scores, when compared "before and after" the application of the respiratory exercises, muscle relaxation and lumbosacral massage strategies at the three moments they were used, at 6, 8 and 9 cm of cervix dilation, and shower bathing at 8 and 9 cm, denote that these strategies were effective in relieving pain, therefore being appropriately included in the Doctoral Dissertation instrument.

In this sense, this research offered relevant experience in the identification of these strategies in women giving birth, making it possible to apply them in the relief of labor pains in the same study field during data collection for the Doctor's Thesis. In addition, it reinforces the importance of seeking humanization in the parturient care process at all times.

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